<u>AMENDMENTS TO THE DRAWINGS</u>:

Applicant has attached an added sheet showing added Figure 19.

REMARKS

Claims 26-47, and 52-57 will be pending in the application after entry of the forgoing amendment.

The Examiner provisionally rejected claim 26, alleging nonstatutory obviousness-type double patenting as being unpatentable over claim 26 of copending U.S. Application 11/595,865 in view of Zur et al. (U.S. Patent No. 5,833,549). Although Applicant has not evaluated whether Application 11/595,865 and Zur et al. present a double patenting problem for the amended claims of the instant application, Applicant has enclosed a terminal disclaimer directed to Application 11/595,865.

The Examiner objected to the specification as allegedly failing to provide proper antecedent basis for the claimed subject matter (e.g., information storage medium). Applicant has amended page 8 of the specification to address this objection by the Examiner. Support for this amendment may be found, for example, in originally filed page 8 and claims 4 and 5.

The Examiner rejected claims 1, 3, 9, 11,15 and 49 under 35 U.S.C. §103 as allegedly being unpatentable over Lipps et al. (U.S. Patent No. 5,741,182) in view Marinelli (U.S. Patent No. 6,157,898) and further in view of Ogawa (U.S. Patent No. 4,742, 264). (Office Action page 4); rejected claims 26, 28-32, 35-37, 39, 41, 44-47, 52 and 53 are rejected under §103 as being unpatentable over Lipps et al. (U.S. Patent No. 5,741,182) in view of Zur et al. (Office Action page 24).

Applicant has cancelled claims 1-25, and 48-51 and amended claims 26-47.[1]

Applicant submits that the pending claims, as amended, are nonobvious in view of the art of record, and otherwise comply with the statutes and regulations.

Support, not limitation, for amended claim 26's recitation of "said acceleration correlated signal indicating a plurality of different non-zero acceleration values. . ." may

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[1]. Incidentally, Applicant has eliminated or avoided the redundant term "at least" because, in U.S. practice, an article ("a", "an") normally encompasses one and or more than one, a counted element normally encompasses either the number counted or more than the number, and a part normally encompasses the part as well as the whole.

be found, for example, in acceleration sensor 56 having piezoelectric buzzer 52 in FIG. 5, and FIG. 6(B). Of course, claim 26 is not limited to the signals or parts described in the above cited sections of the specification.

Support, not limitation, for amended claim 26's recitation of "a second signal-generator incorporated in said input device to output a second signal in response to said accelerated correlation signal" may be found, for example, in the circuitry in the bat downstream from acceleration sensor 56 shown in figure 5 or figure 15. Of course, claim 26 is not limited to the signals or parts described in the above cited sections of the specification.

Support, not limitation, for amended claim 39's recitation of "a first signal-generator incorporated in said input device to output a signal that is a step function of a force generated upon moving said input device in said three-dimensional space by said game player." may be found, for example, in FIG. 6 (C) and FIG. 6 (A) or, in the alternative, page 7, lines 11-14, disclosing that "the acceleration switch may accommodate a weight for displacement within a cylindrical housing wherein the weight is elastically biased by a spring. When the input device is swung, a centrifugal force acts upon and displaces the weight against the spring, turning on the switch", with page 14, lines18-24, disclosing "where using the acceleration switch 38 of the type explained before with reference to FIG. 3, it is satisfactory to determine, in place of the step S4, whether or not a signal has been outputted from the acceleration switch. In this case, it is natural to omit the process concerning the rotation-speed retained value as in the step S2 and S5. That is, when using the acceleration switch, a direction and distance of a batted ball is determined according to timing the acceleration switch 38 (FIG. 3) turns on and ball a43 position." Of course, claim 39 is not limited to the signals or parts described in the above cited sections of the specification.

Support, not limitation, for amended claim 39's recitation of "a second signal-generator incorporated in said input device to output a second signal in response to said first signal." may be found, for example, in the circuitry in the bat downstream from the acceleration switch. Of course, claim 39 is not limited to the signals or parts described in the above cited sections of the specification.

Support, not limitation, for the amendment to claims 27 and 40 may be found, for example, on page 13, line 24-page 14, line 3., disclosing that the game processor 40 determines parameters of moving speed, direction, etc. in a reverse direction of the ball a43 hit by the bat according to, *inter alia*, "ball a43 position (pitched-ball course)".

Lipps et al. disclose an apparatus including a video baseball-simulating game and a special bat containing a combination of electronic, mechanical, and optical components for providing infrared radiation or other energy (typically electrical) that is modulated when the player swings the bat and thus actuates a centrifugal switch therein. Receiving and decoding means receive the energy and, responsive thereto, provide digital signals to software in the video game to control an animated batter in the visual display therein. Lipps et al. Abstract.

The baseball accessory device typically comprises a simulated baseball bat 4 with a built-in centrifugal or other inertial switch 5 to sense the timing of the player's swing. In a currently preferred form of the invention, the centrifugal switch 5 comprises a disc 15, made of steel or other dense material, that moves longitudinally in a guide housing 16. When the bat 4 is swung, the disc 15 is propelled toward the outer end of the bat 4 pressing a switch actuator 17 against a return spring 18 to close or open a switch 19 … Lipps et al. col.2, lines 34-44.

Typically the player stands with the simulated bat as he watches the action in the baseball video game. At the appropriate time, the player stands with the simulated bat prepared to swing. As the player watches the pitcher in the video game deliver a pitch, the player times the speed and estimates whether the pitch will arrive in the strike zone, and thus be "hitable". If the player expects the ball to be hitable, he swings the bat to meet the timing of the pitch. Lipps et al. col.3, lines 6-13.

When the player swings the bat, an internal inertial switch senses the motion and activates a circuit which sends a signal to the video game console to control the animated batter in the game. The game software determines whether the swing results in a hit. Lipps et al. col.3, lines 14-17.

If the player makes a hit, he can then control the base runner by pressing the appropriate buttons on the handle of the bat. Similarly, the player can control the leadoff

and base stealing with the buttons on the bat handle. The specific features of the game are determined by the game software. Lipps et al. col. 3, lines 18-23.

The player views the pitch as it approaches on the TV or computer screen. If the player believes that the pitch will be delivered in the strike zone, he can swing the bat 46 in an attempt to "hit" the ball. If the ball is in the strike zone, and the player has the right timing, a hit will result, and the action of the video game will respond appropriately. If the pitch is delivered outside the strike zone or the player's swing is too early or too late, the batter will be charged with a strike. Lipps et al. col. 3, lines 54-62.

According to Lipps et al., <u>enhanced forms of the invention may detect more information about the swing, such as speed, height, upward or downward angle, etc. to perform a better simulation of game play</u>. However, the currently available baseball game software operates primarily from the timing of the swing, and the functions of the invention at present are implemented to the extent of the currently available software support. Additional features can be added as allowed by increased sophistication of the available game software. Lipps et al. col. 1, lines 45-53. (emphasis added).

Marinelli purports to disclose a speed, spin rate, and curve measuring device using multiple sensor types, the device being for measuring a movable object, such as a baseball, football, hockey puck, soccer ball, tennis ball, bowling ball, or a golf ball. Part of the device, called the object unit, is embedded, secured, or attached to the movable object of interest, and consists of an accelerometer network, electronic processor circuit, and a radio transmitter. The other part of the device, called the monitor unit, is held or worn by the user and serves as the user interface for the device. The monitor unit has a radio receiver, a processor, an input keypad, and an output display that shows the various measured motion characteristics of the movable object, such as the distance, time of flight, speed, trajectory height, spin rate, or curve of the movable object. Marinelli Abstract.

Participants of many sports, including baseball, football, soccer, hockey, tennis, and golf, and their coaches, are often interested in knowing the motion characteristics of the object used in a sport, such as the distance, time of flight, speed, height, spin rate, or curve of thrown, kicked, or batted balls and slapped hockey pucks. . . . Spin rate and axis

of rotation information is useful for example in optimizing a baseball pitcher's curve ball pitching ability. Marinelli col. 1, lines 23-42.

[N]one of the systems proposed are able to measure the ball's spin rate, curve, or axis of rotation. Marinelli col. 2, lines 11-13.

The intent of the invention is to provide the user with statistics about the trajectory of a spinning movable object. Marinelli col. 6, lines 56-58.

The detection of centrifugal force is essentially the detection of spin. For example, baseballs and footballs spin when tossed and generally do not spin otherwise. Therefore, if monitor unit 108 is programmed by the user with the distance of a ball's toss, which can be entered by the user with keypad 116, monitor unit 108 can calculate the ball's speed if the ball transmits to monitor unit 108 its spin time, since spin time equals time of flight. Marinelli col. 7, line 66 - col. 8, line 6.

The g-forces experienced internal to a spinning ball are proportional to the square of the ball's spin rate. Since the acceleration sensors of acceleration sensor network 102 and electronic processor circuit 104 are able to measure the magnitude of the centrifugal forces, the spin rate can be deduced. Transmitting the g-force or spin rate information from radio transmitter 106 to radio receiver 110 of monitor unit 108, along with the spin time datum (the amount of time that the ball was spinning) allows monitor processor 112 to calculate not only the speed and spin rate of a toss, but also the calculated potential for the ball to `curve`. . . . Marinelli col. 8, lines 7-17.

Acceleration sensor network 102 may contain accelerometers of one or more of the following types: piezoelectric, mechanical, micro-machined silicon chip, or any other type small enough to be embedded, secured, or attached in a movable object. . . . Marinelli col. 8, lines 45-49.

Acceleration sensor network 400A is designed to detect or measure the <u>spinning</u> of the movable object <u>about one or more internal axes that run through center</u> of movable object 414A. Marinelli col. 14, lines 42-45. (emphasis added).

Zur et al. disclose an arrangement for use in training players of a game during a simulated game session in the correct use of a game implement that has to be moved properly during an actual game to encounter a ball and impart to the latter a desired

trajectory of movement after impacting the same includes light-emitting devices that emit at least one initial and two subsequent detection light beams from locations arranged at the corners of a triangle into substantially vertically oriented upwardly conically diverging spatial sectors. A reflective surface associated with the implement reflects the light of the respective detection light beam back to the respective location as the implement passes through the respective spatial sector with an intensity that is in a predetermined functional relationship when reaching the respective location to the distance of the reflecting means from the same location and to the degree of penetration of the reflecting means into the respective spatial sector. Respective photosensors are provided at each of the locations and sense the intensity of the detection light returning to the location substantially only from the spatial sector after having been reflected from the implement as it moves through the respective spatial sector. The thus detected peak of the intensity of the returned light and the time at which such peak had occurred at each of the locations are then used to determine the respective distances of the implement from all of the locations and the times of passage thereof past such locations and from that various parameters of the movement of the implement including its speed and various angles assumed thereby while moving in a path above the arrangement towards a ball encounter location. Zur et al. Abstract.

Zur et al. aim to devise a game training arrangement of the type here under consideration which <u>renders it possible to collect a sufficient amount of data of different kinds descriptive of the path and speed of movement of the implement to be able to reliably predict the trajectory of an imaginary ball</u> after having been impacted by the implement in a simulated game. Zur et al. col. 2, lines 7-11. (emphasis added).

It will be appreciated that, while the factors that determine the path of the ball (actual or virtual) after its encounter with the game implement are many and varied, the azimuth angle β plays an important role in determining whether the ball will go into the left, center or right field, whereas the elevation angle α has much to do, together with the exact point of impact of the ball on the surface of the implement 12 (which is round in the case of the bat), with the rate at which the ball is lifted (or grounded) after the impact, and hence with the distance traveled by the ball for a given speed of the implement 12. Zur

et al. col. 10, lines 8-18.

Intermediate the entry and exit times, the controller is noting the light intensity level of the output signal for each measuring cycle (60 μ secs). If the current level is greater than the previous level, then the current level is stored as the "peak" level. Zur et al. col. 10, lines 49-55. This peak is then correlated with an elevation or height distance of the bat relative to the housing. Zur et al. col. 10, lines 56-59. The peak determines the height of the bat, and this height, together with the entry and exit times, is used to calculate the speed of the bat. Zur et al. col. 10, lines 60-63.

The way the calculated values of the speed and various angles of the implement 12 are coordinated with the data signaling the parameters of approach movement of the pretend ball to obtain corresponding values for the movement of such ball after its encounter with the implement 12 is not the subject of the present invention and, hence, will not be discussed here in any detail. Suffice it to say that the trajectory of movement of the simulated ball after it had been hit by the implement 12 is calculated with a high degree of verisimilitude based on information obtained from actual playing of the game, so that the data obtained from the simulated (training) sessions have applicability to real-game situations and can be relied upon for training purposes with assurance that good results in training will be translated into equally good results in the field or on similar playing grounds. Zur et al. col. 10, lines 19-33.

In contrast to the art of record, each of amended claims 26-38 and 54-56 recites, *inter alia*, a ball game apparatus configured to operate with a screen of a display device, said ball game apparatus comprising an input device including a handle to be moved in a three-dimensional space by a game player, to produce a movement for simulating an interception of a ball; a first signal-generator incorporated in said input device to output an acceleration correlated signal according to an acceleration upon moving said input device in the three-dimensional space to produce said movement for simulating an interception of a ball, said acceleration correlated signal indicating a plurality of different non-zero acceleration values; and a game processor for determining, based on said second signal, outputted in response to said acceleration correlated signal, and a moving timing of said ball character that is a position of said ball character in a depth direction in said screen, a moving direction of said ball character as a parameter for a movement of the ball character after a hit. (Base claim 26, as amended). No reasonable combination of the art of record, including Lipps et al. and Marinelli, would have suggested amended claim 26's interrelation of structure, including determining a moving direction of a ball character based on the second signal outputted in response to the recited acceleration correlated signal, and a moving timing of the ball character that is a position of the ball character in a depth direction.

Applicant concedes that it was known to measure the spin rate of an object by measuring centrifugal force, as exemplified by Marinelli. Lipps et al., however, is not directed to the problem of measuring spin rate; they are directed to detecting the swing of a baseball bat for the purpose of simulation. According to Lipps et al., "enhanced forms of the invention may detect more information about the swing, such as speed, height, upward or downward angle, etc. to perform a better simulation of game play." [2] To detect such additional information about the swing, one would not have been motivated to attempt to use circuitry for detecting the spin rate of a continuously spinning object, such

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2. Lipps et al. col. 1, lines 45-53.

as taught by Marinelli.[3] One would not have an expectation that the spin rate measuring circuitry of Marinelli would be an appropriate source for additional information about a bat swing, which is a relatively discreet movement for intercepting a baseball.

Furthermore, claim 26 recites determining a moving direction based on a moving timing of the ball character. In a real baseball game, the moving direction of the ball depends on the angle of the bat and the velocity vector of the ball just before hitting. Thus, Lipps describes a better simulation as depending on more information about the swing, not on information already existing in Lipps.

The Examiner stated "it would have been obvious to one skilled in the art, at the time of the Applicant's invention, to represent objects utilized in the video game taught by Lipps et al. (e.g., such as a baseball and/or baseball player) in 3D, because through the incorporation of depth it would provide a means of achieving greater realism, which is what Lipps et al. is directed toward (e.g., realism; Lipps et al. - col. 1, 11. 39-44), thus resulting in a more immersive gaming experience for a given player utilizing said system" (page 20, lines 3-9, Final Action).   Applicant understands that one skilled in the art may combine a 3D technique with the technique of Lipps. Even given such a combination, however, it would not have been obvious to have the combination of claim 26, including the step of determining a moving direction based on the position of the ball character in a depth direction.

Instead, to perform a better simulation, one skilled in the art would look to more information about the swing, such as disclosed in U.S. Patent 5,833,549 to Zur (Fig. 5, showing the angle α of the bat is measured); or U.S. Patent 5,435,554 to Lipson (ball trajectory determined by the initial hit angle and the initial velocity of the ball coming off the bat (column 16, lines 34-35), initial hit angle determined based on the batter's joystick position (column 15, line 67- column 16, line 2)).

Ogawa cannot make up for the deficiencies of the other references.[4]

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3. Cf. Zur et al., in the same field (simulation) as Lipps et al., disclosing use of light detection to detect batting angles.

4. The Examiner stated that "Ogawa teaches a piezoelectric buzzer having a piezoelectric ceramic plate and electrodes respectively formed on main surfaces of said piezoelectric ceramic plate (col.

<u>Claim 52</u>

Claim 52 is patentable because it recites, *inter alia*, an information storage medium including a program readable by a game processor in a ball game apparatus for playing a ball game, said ball game apparatus comprising an input device including a handle to be moved in a three-dimensional space by a game player, to produce a movement for simulating an interception of a ball; a first signal-generator incorporated in said input device to output an acceleration correlated signal according to an acceleration upon moving said input device in the three-dimensional space to produce said movement for simulating an interception of a ball, said acceleration correlated signal indicating a plurality of different non-zero acceleration values, said program causing said game processor to determine, based on the recited second signal and a moving timing of said ball character that is a position of said ball character in a depth direction in said screen, a moving direction of said ball character as a parameter for a movement of the ball character after a hit.

1, ll. 24-37; "The present invention relates to a piezoelectric sound generator which is applied to, e.g., a piezoelectric buzzer or a piezoelectric loudspeaker, and more particularly, it relates to a piezoelectric sound generator including a monolithic sintered body which is obtained by laminating a plurality of ceramic green sheets and electrodes and cofiring the same." - col. 1, ll. 9-15; col. 4, ll. 25-44; Fig. 1)." (Office Action page 7, lines 11-18).

In contrast to the art of record, each of amended claims 39-47 and 57 recites, *inter alia*, a ball game apparatus comprising a first signal-generator incorporated in said input device to output a signal that is a step function of a force generated upon moving said input device in said three-dimensional space by said game player; and a game processor for receiving said second signal, outputted in response to said first signal that is said step function of said force generated upon moving said input device, and determining, based on said second signal and a moving timing that is a position of said ball character in a depth direction in said screen, a moving direction of said ball character as a parameter for a movement of said ball character after a hit. (Base claim 39, as amended). No reasonable combination of the art of record, including Lipps at al. and Zur et al., would have suggested amended claim 39's interrelation of structure, including the recited processor for determining a ball moving direction after a hit based, *inter alia*, on the second signal that is outputted in response to the recited first signal that is the step function of force, and a moving timing that is a position of said ball character in a depth direction.

In a real baseball game, the moving direction of the ball depends on the angle of the bat and the velocity vector of the ball just before hitting. Thus, Lipps describes a better simulation as depending on more information about the swing.

The Examiner stated "it would have been obvious to one skilled in the art, at the time of the Applicant's invention, to represent objects utilized in the video game taught by Lipps et al. (e.g., such as a baseball and/or baseball player) in 3D, because through the incorporation of depth it would provide a means of achieving greater realism, which is what Lipps et al. is directed toward (e.g., realism; Lipps et al. - col. 1, ll. 39-44), thus resulting in a more immersive gaming experience for a given player utilizing said system" (see page 20, lines 3-9, Final Action).

Applicant understands that one skilled in the art may combine a 3D technique with the technique of Lipps. Even given such a combination, however, it would not have been obvious to have the combination of claim 39, including the step of determining based on

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the recited second signal and the moving timing that is the position of the ball character in a depth direction.

Instead, to perform a better simulation, one skilled in the art would look to more information about the swing, such as disclosed in U.S. Patent 5,833,549 to Zur (Fig. 5, showing the angle α of the bat is measured); or U.S. Patent 5,435,554 to Lipson (ball trajectory determined by the initial hit angle and the initial velocity of the ball coming off the bat (column 16, lines 34-35), initial hit angle determined based on the batter's joystick position (column 15, line 67- column 16, line 2)).

Thus, amended claim 39 is patentable for the reasons above alone.

Furthermore, Applicant notes that Lipps et al. contemplate other simulations based on detection of "more information about the swing, such as speed, height, upward or downward angle, etc. to perform a better simulation of game play."[5] Thus, there would have been no suggestion to provide the determining of ball movement of Applicant's claim 39 based on data already existing in Lipps et al., namely the output of the centrifugal switch of Lipps et al. "It is impermissible within the framework of section 103 to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art". *In re Wesslau*, 353 F.2d at 241, 147 U.S.P.Q. at 393.

Claim 53

Claim 53 is patentable because it recites, *inter alia*, an information storage medium including a program readable by a game processor in a ball game apparatus, said ball game apparatus comprising an input device including a handle to be moved in a three-dimensional space by a game player, to produce a movement for simulating an interception of a ball; a first signal-generator incorporated in said input device to output a first signal, said first signal being a step function of a force generated upon moving said input device in said three-dimensional space by said game player, said program causing

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5. Lipps et al. col. 1, lines 45-53 (emphasis added).

said game processor to determine, based on a timing of said second signal and a moving timing that is a position of said ball character in a depth direction in said screen, a moving direction of said ball character as a parameter for a movement of said ball character after a hit.

If the Examiner has any questions, Applicant's representative can be reached at 703-684-4840.

Respectfully submitted,

Jerome D. Jackson
Reg. No. 33,186

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Jackson Patent Law Office
211 N. Union Street, Suite 100
Alexandria, Virginia 22314
United States

Telephone +1 703-684-4840
Facsimile +1 703-995-0318